

Technical Report 11-004

Lesson and Impressions of the Ghanaian Capital Markets

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Iain Cruickshank
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U.S. Military Academy, West Point NY

July 2011





**United States Military Academy
Network Science Center**

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Lesson and Impressions of the Ghanaian Capital Markets

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Foreword

A three-person research team from the Network Science Center at West Point spent a week in Accra, Ghana's largest city and socioeconomic epicenter, from the 11th through the 18th of July 2010. The team surveyed a broad range of cultural and business organizations. The researchers met with prominent members of the financial community and took advantage of numerous opportunities to socialize with Ghanaians. This paper provides a summary of our experiences and our assessment of Ghana's socioeconomic conditions, greatest economic challenges, and opportunities. Our trip was funded through a research grant provided by the Army Research Office to study the application of network science techniques to Frontier Capital Markets. We culminate this report with a commentary on future challenges with this line of research and the team's proposed way ahead.

Project Background

The Frontier Markets project aims to discover underlying metrics that describe Frontier Capital Markets through a network-based analysis of Capital Market development and stability. We will model how Frontier markets succeed and fail through large-scale quasi-experiments. A 1993 National Bureau of Economic Research (NBER) paper quantitatively demonstrated that income equality fuels social discontent and increases socio-political instability. "The latter, by creating uncertainty in the politico-

economic environment, reduces investment. As a consequence, income inequality and investment are inversely related”¹

In undeveloped Capital Markets, achievement of the Frontier Capital Market designation is an initial step for access to Foreign Direct Investment. Global investment encouraged by the presence of a well-established and liquid Capital Market can promote stability, and consequentially, reduce the probability of international military intervention or shorten the requirement for military involvement. The International Monetary broadly defines “Financial stability” as the financial system’s ability to facilitate “an efficient allocation of economic resources,” to promote the “effectiveness of other economic processes (such as wealth accumulation, economic growth, and ultimately social prosperity), to assess, price, allocate, and manage financial risks, [and]... to maintain its ability to perform these key functions—even when affected by external shocks or by a buildup of imbalances — primarily through self-corrective mechanisms”²

Project Approach

This research project focuses on Frontier/Pre-Emerging Capital Markets as the context of study. In the course of our analysis we will, develop new network-based metrics of the Capital Market State that enhance current Econometric and Policy-type Market State descriptions. Finally, we will develop new network models and methods to understand and predict the network’s response when the network is perturbed or altered.

¹ Alesina, Perotti. “Working Paper 4486.” NBER Working Paper Series Oct 1993. #. The National Bureau of Economic Research.

Web.11 Jul 2011

² Schinasi, Garry “International Monetary Fund Working Paper, Defining Financial Stability.” May 2011. Web. 2004

In order to achieve these goals, the research team will:

- Collect data and model three designated Frontier Capital Markets. This data will include all open-source network-related information from social networks to organizational information.
- Send research teams to these capital markets to meet and interview identified key nodes in the network and validate the models as created.
- Develop innovative techniques to compare frontier markets at the macro level such as a capital market functions network framework.
- Conduct a mathematical analysis to determine if the team can quantitatively differentiate the three constructed Frontier Capital Markets models.
- Conduct a quantitative analysis to determine the key similarities and differences between the models.
- Construct a similar model of an emerging capital market and conduct a vertical comparison between the emerging market network and the frontier market networks.
- Develop a graph-based framework to monitor the progress or setbacks in frontier market establishment and transition to emerging market status.
- Integrate Behavioral Economic models of individual decision-making to establish a network based description.

Ghana's Political and Economic Background

Ghana is situated in Western Africa, bordering the Gulf of Guinea between Cote d'Ivoire and Togo. It shares a border with Burkina Faso to the north. With 24 million

people (47th largest in the world), Ghana has a GDP per capita of \$1,500 per year. Ghana was formed from the merger of the British colony of the Gold Coast and the Togoland trust territory and became the first sub-Saharan country in colonial Africa to gain its independence in 1957. The government under Ghana's first Prime Minister, Kwame Nkrumah, sought to develop Ghana as a modern, semi-industrialized, unitary socialist state. Ghana endured a long series of coups before a group of junior officers and noncommissioned officers led by Flight Lieutenant Jerry Rawlings took power in 1981 and banned political parties. After approving a new constitution and restoring multiparty politics in 1992, Rawlings won presidential elections in 1992 and 1996, but was constitutionally prevented from running for a third term in 2000. John Kufuor succeeded him and was reelected in 2004. John Atta Mills took over as head of state in early 2009.³⁴

At independence, Ghana had a substantial physical and social infrastructure and over \$480 million in foreign reserves. The Nkrumah government focused on enhancing the infrastructure and made numerous public investments in the industrial sector. Many Nkrumah-era investments were large public works projects and ambitious agricultural and industrial projects. Commodities prices fell dramatically during the early 1960's. The country's foreign exchange reserves were quickly depleted so the government borrowed heavily to finance many projects. By the mid-1960s, Ghana's reserves were depleted, and the country could not meet debt repayment schedules. The National Liberation Council responded by abandoning unprofitable projects and selling some inefficient state-owned enterprises to private investors.⁵⁶

³ United States. Background Note: Ghana. , 2010. Web. 11 Jul 2011.

⁴ United States. World Factbook, 2011. Web. 11 Jul 2011.

⁵ United States. Background Note: Ghana. , 2010. Web. 11 Jul 2011.

⁶ United States. World Factbook, 2011. Web. 11 Jul 2011.

Ghana remains heavily dependent on international financial and technical assistance. Well endowed with natural resources, Ghana has roughly twice the per capita output of the poorest countries in West Africa. Gold and cocoa production are major sources of foreign exchange. Interestingly, the country's largest source of foreign exchange is remittances from workers abroad. Oil production has expanded. According to industry experts, within 5 years, Ghana is likely to be the third-largest producer of oil in West Africa.⁷⁸

The domestic economy continues to revolve around agriculture (mainly small landholders), which accounts for more than a third of GDP and employs more than half of the work force. Ghana's industrial base is relatively advanced compared to many other African countries. U.S. State Department reports the most prominent industries include textiles, apparel, steel, tires, flour milling, cocoa processing, beverages, tobacco, simple consumer goods, and car, truck, and bus assembly. Industrial production, including mining, manufacturing, construction and electricity, accounts for about 30% of GDP. The current government's stated goals are to accelerate economic growth, improve the quality of life for all Ghanaians, and reduce poverty through macroeconomic stability, increased private investment, broad-based social and rural development, as well as direct poverty-alleviation efforts. Improving macro-economic conditions along with high prices for gold and cocoa helped sustain GDP growth in 2008 and 2009. Ghana is on track to meet its Millennium Development goal of halving extreme poverty by 2015. Real GDP growth averaged 4% in the mid-1980s and has increased to about 5% over the past decade. Despite recent successes in combating inflation, its inflation rate approached 20% as recently as 2009

⁷ United States. Background Note: Ghana. , 2010. Web. 11 Jul 2011.

⁸ United States. World Factbook, 2011. Web. 11 Jul 2011.

According to the US State Department, the key economic challenges facing Ghana include: overcoming infrastructure bottlenecks, especially in energy and water; effectively managing natural resources; improving human resource capacity and development; establishing a business and investment climate that encourages private sector-led growth, and privatizing remaining state-owned enterprises, several of which are significant budget liabilities.

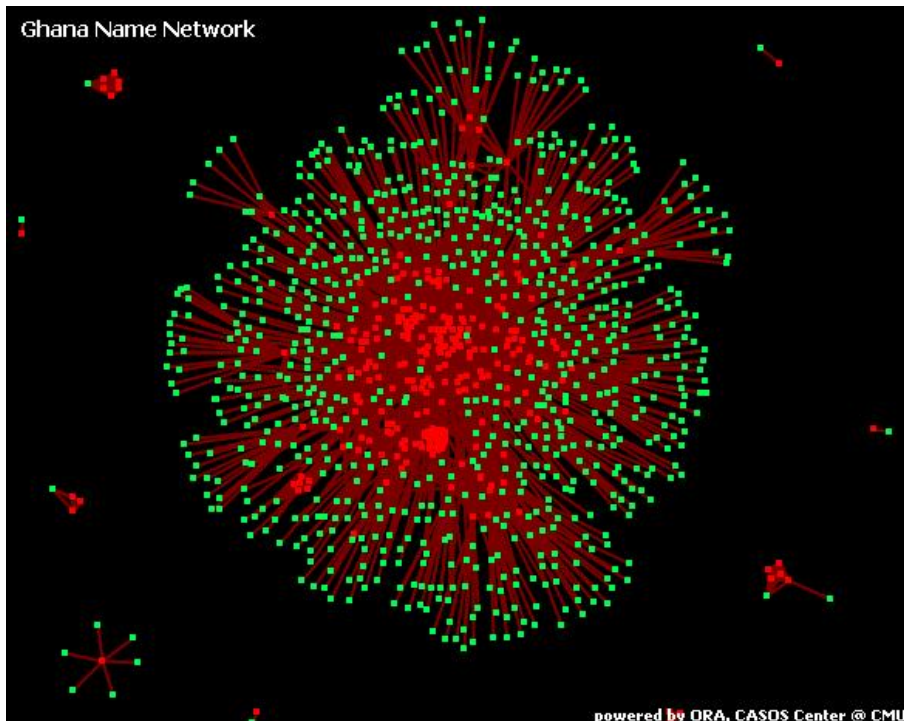
Ghana Interviews Specifics

In preparation for the team's visit, we gathered open-source data on 500+ prominent people and organizations that participate in the Ghana Capital Markets. The team studied the Ghana Stock Exchange (<http://www.gse.com.gh/>) as a starting point in the development of the network. We initially looked at the management and Governing Council of the Ghana Stock Exchange and then gathered information on brokerage firms that operate on the exchange including members of these firms. Next, we collected information on key members of the Central Bank, the Ministry of Finance, The Ghana Securities Exchange Commission and other appropriate Government organizations. The next step included collecting information on key members of all publicly traded companies as well as key parastatal organizations (legal entities created by a government to undertake commercial activities on behalf of the owner government). Finally, the team gathered information on prominent business groups, social groups, and the Ghanaian military.

Using ORA network analysis software developed by the Center for Computational Analysis of Social and Organizational Systems at Carnegie Mellon University, the team constructed the initial network typology depicted in Figure 1 below. The team conducted an initial quantitative analysis of this network in order to identify "key nodes" - both people and organizations. The team also developed two additional descriptive models: one that illustrates how people are connected through organizations (Figure 2) and one that illustrates how organizations are connected through people

(Figure 3). These two models allowed the team to determine the most influential people and organizations in the Ghana Capital Market Network. Based on this initial analysis, the team developed a strategy to meet with and interview as many of these individuals (or nodes) as possible.⁹

Figure 1: Initial Ghana Network



⁹ "Center for Computational Analysis of Social and Organizational Systems." Welcome to Center for Computational Analysis of Social and Organizational Systems (CASOS)!. Carnegie Mellon, n.d. Web 11 Jul 2011.

Figure 2: Initial Ghana Agent (People) Network

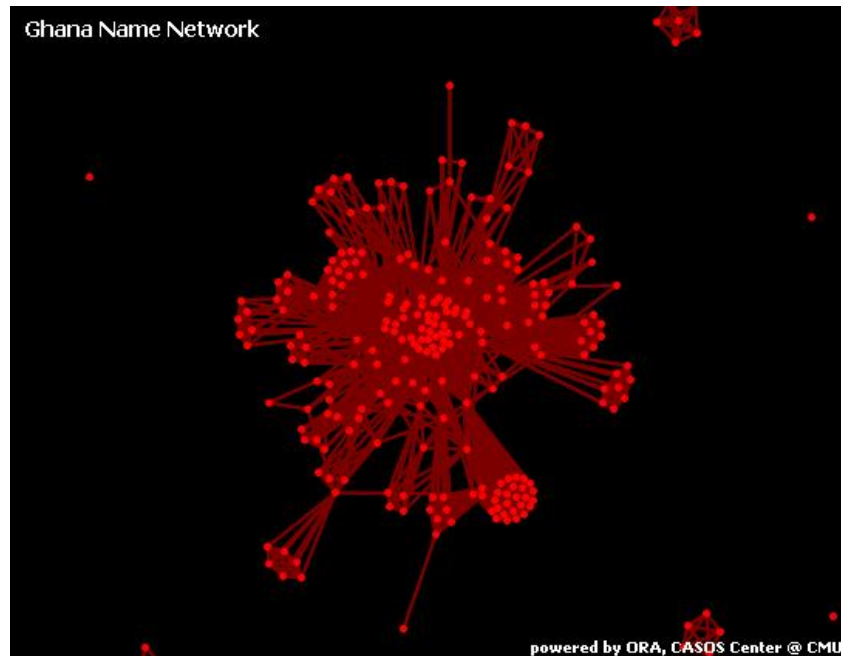
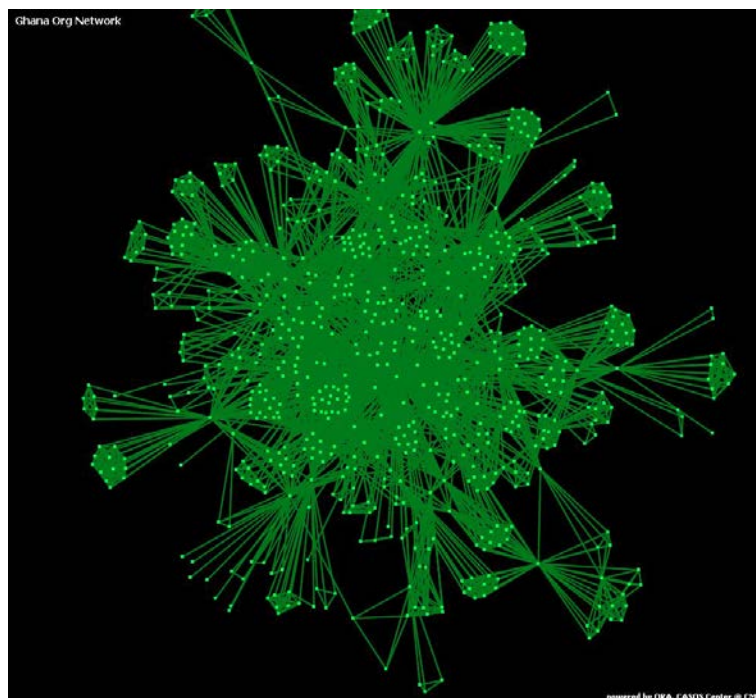


Figure 3: Initial Ghana Organization Network



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Team members coordinated via telephone, email, and appropriate social network platforms. The professional online networking site, LinkedIn.com, in particular, has groups with specific interests that proved to be very beneficial. In general, we were very successful in arranging meetings with individuals at the majority of our identified financial firms but less successful with members of government organizations. The meetings with government or regulatory groups were mainly arranged by our contacts in the finance community.

Interviews:

Dr. Kwabena Riverson	NTHC Ghana www.nhtcghana.com
	Council for Scientific and Industrial Research www.csir.org.gh
Mr. Akwasi Boahene	Fidelity Bank Ghana www.fidelitybank.com.gh
Anononymous Brokers	Fidelity Bank Ghana www.fidelitybank.com.gh
Mr. Ekow Afedzie	Ghana Stock Exchange www.gse.com.gh
Ms. Elizabeth Mate-Kole	Ghana Stock Exchange www.gse.com.gh
Mr. Augustine Simons	Ghana Stock Exchange www.gse.com.gh
Mr. Robert Owoo	Securities and Exchange Commission-Ghana www.secghana.org
Mr. Daniel Duku	Venture Capital Trust Fund www.venturecapitalghana.com.gh

Mr. Anthony Siaw	Venture Capital Trust Fund www.venturecapitalghana.com.gh
Dr. Herbert A.Obiri	Council for Scientific and Industrial Research www.csir.org.gh
Dr. A.W.Q. Barnor	NTHC Ghana www.nhtcghana.com
Mr. Francis K. Nyoagbe	NTHC Ghana www.nhtcghana.com
Mr. David Abbey	Fidelity Bank Ghana www.fidelitybank.com.gh
Mr. Emmanuel Tsigby	New World Renaissance-Ghana www.renaissancegroup.com
Mr. Mayokun Ajibade	Standard Chartered Bank-Ghana www.standardchartered.com/gh/en/
Dr. George Essegbey	Council for Scientific and Industrial Research www.csir.org.gh
Dr. N. Obirih-Opareh	Council for Scientific and Industrial Research www.csir.org.gh
Mr. Jophiel Nyemitei	African Legacy Finance Limited Africanlegacyfinancegh.com
Mr. Mario Ariza	Gold Coast Securities Limited www.gcsinvestments.com

Initial Observations and Findings

Optimism and Entrepreneurial Spirit. The research team was overwhelmed by the entrepreneurial spirit and general optimism expressed by the majority of the people we met both in, and out of, the financial industry. Most people were convinced that because of two peaceful government handovers of power, democracy is firmly entrenched in Ghana and that Ghana's future is bright. When we asked about the influence of the military on the political process, we were typically told that they were truly out of politics and exerted limited domestic influence. Additionally, the current administration has effectively addressed inflationary pressures. Consumer-price inflation has slowed from a five-year high of 20.7 percent in June 2009 to 9.5 percent a year later (Ghana Statistical Service, July 14, 2010). A fascinating impact on the national psyche is the success of the Ghanaian Football (soccer) team. The stellar performance of the team in the recent World Cup has noticeably added to Ghanaian optimism. It is hard for Americans to understand how important this success is, but, for an up and coming country like Ghana, success at international events like the World Cup are incredibly important.

Growth of Middle Class. The growth of the Middle Class is evident throughout the capital city of Accra. There are numerous "American-style" housing developments in the suburbs with advertisements for these developments visible on billboards throughout the city. Major shopping centers have been built in many areas of the city. The most prominent, the Accra Mall, (<http://www.accramall.com/>) is a shopping center funded by Actis, a London-based private equity firm (<http://www.act.is/>) that could be situated in any city in the developed world. Additionally, ownership of automobiles has become much more common. Unfortunately, the city's infrastructure has not kept pace and there are limited public transportation options. Therefore, traffic and long commutes are major challenges. Anecdotally, we heard numerous stories of commutes that are much greater than the average American in major cities.

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Role of Capital Markets. The fledgling capital market is not at all the center of the economic network. Rather, commercial banks and to a much larger extent informal networks (e.g., families and friends) finance a majority of the economic activity. With 35 equities thinly traded only three hours a day, the Ghana Stock Exchange is currently a precursor for what is hoped will evolve into a vibrant savings/investment market. Currently only Ghana government debt and one corporate bond issued by Accra-based HFC Bank Ltd. are listed on the exchange. Trades are conducted over-the-counter with the average daily volume of traded shares over a recent 5 day period at approximately **490,000 shares**. Daily volume ranged from a high of 1.2 million shares to a low of 82,000 shares. The average value of shares traded during this period was 246,000 Ghanaian Cedis which is approximately equivalent to \$174,000. This is a very small value even compared to a typical Stock Exchange in an Emerging Market. For instance, the average daily volume of the stocks traded on the Prague Stock Exchange is over 2 million shares with an average daily value of traded shares approaching \$21M. There are two main reasons for this lack of liquidity:

a. The government and institutional investors hold a majority of the available shares in the listed firms. These institutional investors include parastatal retirement funds, large insurance companies and pension funds. For example, the Government of Ghana owns 51% of the equity of Ghana Oil Company Limited (www.goionline.com) and the Social Security and National Insurance Trust owns over 25% of the equity of CAL Bank, a major Ghanaian Bank (www.calbank.net) The parastatal institutions tend to buy shares of “safe stocks” and hold them for the long-term. Based on the limited market capitalization of the listed companies there are few shares available to trade. An investor could distort the market with a bid for a large number of shares. It appears that many of the transactions are prearranged between holders of a large amount of shares at agreed upon prices; many large block transactions do not move the price at all.

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b. The current markets include only the largest firms in Ghana (and some West African firms that are listed on more than one exchange). There is an initiative under way to establish another market for Small and Medium Enterprises (SMEs) with the hope that this would encourage more active stock trading (possibly encouraging more speculators despite potential adverse consequences). This plan will potentially face the same cultural obstacles discussed previously. There is little incentive structure for an entrepreneur to want to “take the company public.” The incentive for many entrepreneurs in developed countries take their companies public is to obtain capital for expansion or to cash out via an Initial Public Offering. In Ghana, there is still a cultural reluctance to give up control of a family business and few instances in which an entrepreneur that has become wealthy by building a company and listing it on the stock exchange. Additionally, the Ghana Stock Exchange is attempting to solve the challenges of the listing procedures. They have to find a balance between collecting sufficient data to inform investors while not making the requirements too onerous on SMEs.

Despite these challenges, The Foreign Exchange Act of 2006 (Act 723) eliminated limits on foreign ownership of equity and debt. Therefore nonresidents can now invest in the Ghanaian market with no limits or prior exchange control approval. This is an incredibly positive initiative. The research team that visited Tanzania last summer discovered that non-residents were limited to ownership of no more than 40% of any firm’s equity. Interestingly, had we not conducted this field research, the initial four criteria we proposed to differentiate markets in our proposal: transparency, liquidity, efficiency, and integration, would have extrapolated network properties on a very small fringe of the overall capital structure of Ghana.

Government Funding. The majority of African nations rely on foreign aid for a large portion of their government's budgets. Ghana, however, is one of the few African

countries to have successfully issued a Government Bond in the international capital market. In September of 2007, the country issued a \$750 million ten-year bond. Many analysts, most notably Dambiso Moyo, an international economist and author of *Dead Aid: Why Aid is not working and How There is a Better Way for Africa*,¹⁰ believe that offering bonds to the international financial community is a much more preferable method to gain access to additional government funding instead of pursuing International Aid. Essentially, issuing debt in capital markets requires extensive underwriting and due diligence to evaluate the creditworthiness of the borrower. Bond financing induces an additional incentive on the borrower to repay the loan which does not exist with traditional international aid; there are too many examples of debt forgiveness and loan defaults. Additionally, the Ghanaian Cedi enjoys active foreign exchange and its transaction volume is increasing which is an indicator of increasing confidence in this swiftly growing capital market.

The “Missing Middle” or Small and Medium Enterprises (SMEs). The situation in Ghana is very similar to the research team’s observations in Tanzania last summer and has been highlighted by the World Bank, the International Monetary Fund, and the Center for Global Development. There are a few, very large businesses in Ghana and many very small businesses. These small businesses are typically "mom and pop" or family run concerns. It is a tremendous challenge to grow these micro-businesses into small and medium businesses (SMEs). This lack of SMEs is due to a combination of factors. Most importantly, it is very challenging to secure business loans in frontier markets for these SMEs without collateral. The rates on available loans are comparably high, about 20%. Microfinance loans are available but there is definitely a "missing middle" as described in the IMF report. Because of the lack of available capital, another alternative to a growing business would be to form a partnership (to pool available

¹⁰ Moyo, Dambisa. *Dead Aid: Why Aid is Not Working and How There is a Better Way for Africa*. New York: Farrar, Straus and Giroux, 2009. Print.

capital) or distribute business equity with outside investors. There is a cultural aversion to giving up control of a family business and privacy concerns inhibit transparency. It is extremely difficult and few incentives exist to encourage small businesses to seek equity financing. Weak demand for corporate bonds is typical in frontier markets. There is only one corporate bond traded on the Ghana Market.¹¹¹²

School Connections. One of the major benefits of the in-country visit and interviews was the ability to gain key insights to the lives of people operating in this financial network. One of the major insights from our discussions was the impact of family and schooling as a key aspect of the financial network in Ghana. School bonds are formed much earlier than we had hypothesized. We initially thought that the university or graduate school that a person attended might be an important part of the network formation. We found that key bonds are formed in Secondary Schools, which are similar to preparatory schools in the United States but are modeled on schools in the British system. Some of the most prominent in Ghana are the missionary schools established in the late 19th Century such as the Mfantsipim School in Gold Coast http://en.wikipedia.org/wiki/Mfantsipim_School. University bonds are important but not nearly as much as we had anticipated. We surmise that the majority of the strong bonds have been already formed but the university bonds complete the "small world" network. Most of the people we interacted with during our visit attended the University of Ghana (the most renowned university in Ghana), although a few attended the Kwame Nkrumah University of Science and Technology in Kumasi. Attending a school in the United States or United Kingdom was also an important factor, especially, when applying for a professional position.

Social Connections. The team hypothesized that social clubs and organizations would

¹¹ United States. World Factbook, 2011. Web. 11 Jul 2011.

¹² Schinasi, Garry "International Monetary Fund Working Paper, Defining Financial Stability." May 2011. Web. 2004.

be important components of the financial network in Ghana. Previously, in Tanzania, we had limited success determining the key organizations beyond "traditional" business organizations such as the CEO Roundtable or Business Development groups. In Ghana, we were able to glean a lot more information. For instance, golf is very popular among the business class in Accra. There are two major country clubs, Achimota and Tema, in Accra. A large number of people we spoke with were members of these clubs although we were not able to determine if one was more exclusive than the other. Another unexpected organization that we came across was the Freemasons, a well-known fraternal organization. A number of financial professionals we met indicated that they were members of this organization and it seemed to be a very important part of this economic network. Interestingly, another Center research team that visited Trinidad and Tobago the week after our Ghana visit reported similar influences of the Masons on the local society and economic network. In fact, they were invited to a Masonic meeting, met with influential members, and gave a short presentation on our on-going economic network research. It was interesting that the Masons are also very influential in many "African-American" social networks in the United States. The team believes that this phenomenon would be an interesting line of research in the future.

Institutions and Corruption. As the conduit for transition from African-socialism to a free market system, the government is intricately involved with Ghana's development. Further, politicians are very intertwined and influential in business and economic development. Corruption was not addressed in the normal course of our conversations. From our meetings, we understand that institutions at this stage in development are simply breeding grounds for corruption. Others whom we met add that while the corruption is inexcusable, the institutions are necessary as Ghana continues to grow. The corruption must, in other words, be dealt with case-by-case but accepted temporarily as a growing pain for institutions in a frontier market.

Human Capital. There is a significant challenge in developing human capital in Ghana.

As with any developing economy, fostering positive growth in the factors for human capital production, like health and education, is difficult. Human capital flight has been a problem even for those people with access to a stable family, healthcare, and quality education, but this appears to be changing. During the course of our short visit, we have met three individuals who have recently returned to Ghana from the United States because of perceived opportunities in this growing economy.

The Way Ahead

Clearly, there have been a number of crucial takeaways from our trip to Ghana. First, we learned most importantly that our notions about the public market clearly still need to be modified and that the model needs to be extended to commercial and informal networks. Second, we learned that there are serious fixed effects issues from socioeconomic history that affect the way informal and formal business is conducted throughout each Frontier Market, which warrants a significant expansion of the markets surveyed, and (perhaps more fruitfully) repeated measures over time for the same markets. Third, we learned that data collection on these networks will be extremely challenging and will require significant preparation of standard operating procedures, particularly for the informal sectors.

Based on the team's productive visit and interviews, we are suggesting several modifications to our analytical approach. First, we will continue to create new and innovative approaches to quantitatively compare the three social-network based frontier market economic network models we have created. Second, the team will develop three different macro-level models that will describe these Frontier Markets. The first of these will be a model based on a Social Network and Financial Function Network link. The second of these will be based on a Resource Generator concept developed by Dr. Tom Snidgers in 2004 that quantifies a concept known as social capital. The last model will focus on key organizations in these capital markets and the roles and interactions

that occur.

References

- Alesina, Perotti. "Working Paper 4486." NBER Working Paper Series Oct 1993. The National Bureau of Economic Research. Web. April 2011.
- Birdsall, Nancy. "International Monetary Fund Working Paper Number 113: Do No Harm: Weak Institutions and the Missing Middle in Africa." Web. August 2010.
- Moyo, Dambisa. *Dead Aid: Why Aid is Not Working and How There is a Better Way for Africa*. New York: Farrar, Straus and Giroux, 2009. Print.
- Schinasi, Garry. "International Monetary Fund Working Paper, Defining Financial Stability." May 2011. Web. 2004.
- United States. Background Note: Ghana. , 2010. Web. August 2010.
- United States. World Factbook, 2011. Web. August 2010.
- Van Der Gaag, Martin, Snidjers, Tom A.B. "The Resource Generator: Social capital quantification with concrete items." August 2010. Web. 2004.
- World Bank. "Increasing Access to Rural Finance in Bangladesh: The Forgotten "Missing Middle." August 2010. Web. 2008.

APPENDIX

Interview Summaries

Each interview session was conducted in relatively the same manner. The individual or group of individuals with whom we met first gave us an introduction of what they do, how their business or organization operates, and some background information on Ghana. 2nd Lieutenant Iain Cruickshank, a recent West Point graduate and currently at graduate student at the University of Edinburgh, typically led the interview by first giving an introduction of our mission and the concept and purpose of social capital and network analysis, followed by a series of questions that explored the sources and effects of the interviewees' social capital. The conversations were flexible and proceeded in such a way that we could best understand their role within the greater social network.

Day 1: 12 July 2010

The team spent most of the day with Dr. Kwabena Riverson at a Ghanaian Investment Bank. Dr. Riverson was introduced to the team via an African Economic Development Group on the social media site LinkedIn. He attended several universities in the United States (University of Pennsylvania), and currently works for NTHC Limited, a pioneering Investment Bank in Ghana.

Dr. Riverson is also associated with the Council for Scientific and Industrial Research, a government Science and Technology Research Center. The CSIR consists of 13 institutes that conduct research and development in various areas in support of the growth of Ghana. Seven of the 13 institutes are centered on agriculture, which indicates the importance the government places on this sector. The CSIR is part private, part government-operated. The government appoints the Director General and fills 40% of the seats on the Management Board with representatives from the various government ministries. The remaining seats are filled by industry professionals. Additionally, the government is the major source of funding for the operations of the

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CSIR. Some funding originates from private businesses and contractors, most of which are local Ghanaian organizations.

NTHC provides insurance, social security (which in Ghana is largely privatized), brokerage advice, and asset management. Dr. Riverson noted that Ghana made the transition from a socialist to capitalist economy only about 20 years ago, and has taken approximately 15 years to privatize. Additionally, he described post-colonial Ghana like much of post-colonial Africa as well as post-colonial United States. Ghana began as a tribal society and then transitioned into one dominated by the government, essentially socialist. Ghana is now presently in a state of quasi-capitalist and rapidly developing toward capitalism. There is a growing middle class, as exemplified by the presence of more vehicles on the road and greater home ownership.

Dr. Riverson believes that government contacts are critical to growing and existing businesses in developing states and markets. Governments provide the central distribution of wealth, and businesses need to register through the government. Thus, individuals wanting to operate a business must use government contacts, which he said “is the norm.” Furthermore, foreign investment, especially in terms of human capital and money is extremely important for business as well; having a foreign business contact is crucial to business success.

He contends that tribalism and family ties still dominate the economic scene. Much of the land is actually owned by tribal entities and many different businesses are almost entirely family affairs. Dr. Riverson stated that the key to social mobility is education. An education is the ticket to advancing one’s career. Ghana has converted its educational system from the British style to the American style (with both direct and indirect foreign assistance). Dr. Riverson noted that having an American MBA would reduce the amount of time it takes for a Ghanaian to find a job.

Day 2: 13 July 2010

The team was put in contact with Mr. Akwasi Boahene an Asset Manager with Fidelity Bank Ghana through the efforts of Mr. Hubert Danso, Vice President of African Investment Advisors, a project advisory firm based in South Africa.

Mr. Boahene met the team at Cedi House, and led us throughout the entire day to all of our interviews. His input sometimes extended into the other interviews detailed below. Mr. Boahene stated that it is “very, very” important for firms to have government contacts. Networking is vital for the implementation of business activity.

Additionally, he stated that currently expertise for Ghanaian businesses largely comes from foreign companies and sources. Ghana’s economy in its current form is very young, and technology, knowledge, and other human capital come from outside of Ghana.

The privatization of Ghana’s economy has loosened financial capital, thereby enabling the rise of the middle class and increasing their purchasing power. One of the key problems is that credit is still constrained because there is limited capability to force repayment. Tribal leaders also maintain much land ownership and can therefore exact fees from companies or businesses operating on their land. Some degree of power sharing exists between tribal and government leaders, but tribal leaders are more focused on local community matters and largely uninvolved in national politics.

Mr. Boahene discussed the real estate boom of recent years. He said that property in Ghana does not depreciate; it only appreciates. Interestingly, we thought similar thoughts in the US for many years. Mr. Boahene then escorted us to a brokerage and trading firm, where we spoke with a lady named Cecilia (she did not give a last

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name) and another gentleman (who also did not give his name). Cecilia was a broker. She largely underplayed the role of social contacts in her line of work and in the economy in general. She claimed that government contacts at her level were unnecessary; the only contacts she needed were those with individuals and other firms. Foreign sources do not play a large role; tribal, familial, and ethnic ties in business are absent; and social mobility is all merit-based.

We also discussed the role of sports, particularly soccer and golf, in business. Since nearly everyone in Ghana is a fan of soccer, it is often a good ice-breaking tool for meeting new clients, business associates, or other contacts. However, soccer's use for social capital seems minimal. Rather, golf is the "sport of the elites" and being a member of a prestigious golf club may be more influential in increasing social capital.

Mr. Boahene then took the team for a visit to the Ghana Stock Exchange, which is also located in Cedi House. At the Stock Exchange, the team met with Mr. Ekow Afedzie-the Deputy General Manager (2nd in Charge), Ms. Elizabeth Mate-Kole- the General Manager, and Mr. Augustine Simons-the Chief of the Exchange's Information technology Department. The team took a tour of the facilities and spent time meeting with these three individuals.

The GSE is independent of the government but the Government had a large hand in the original founding of the exchange, largely through the efforts of the NTHC. The government still influences the organization and its operations. For instance, it has the final approval authority for registering and sanctioning companies to be listed on the stock exchange. The GSE has a Council of Governors that serves a traditional "Board Function." There are 18 broker/dealers that are licensed to operate on the exchange. Stocks of 35 publicly-traded companies are listed on the exchange as well as various Government Bonds. Trading is conducted electronically and the market is officially open for three hours each trading day. Liquidity is a major issue-we will discuss this in

more depth in the Findings section of this paper. Total equity market capitalization at the end of the 1st quarter 2010 reached 17,815.51 million Ghanaian Cedis (US\$ 12,566.49 million) and the total volume of shares traded reached 26.58 million for the 1st quarter of 2010. The Foreign Exchange Act of 2006 (Act 723) did away with limits on foreign ownership of equity and debt. Therefore non-residents can now invest in the Ghanaian market with no limits or prior exchange control approval. Tight credit and a lack of liquidity in the market have made it very resistant to change and the government has been lacking in providing the necessary incentives to address these issues.

Mr. Boahene then escorted the team to meet with Mr. Robert Owoo, the Head of Research and Market Development at the Ghanaian Securities and Exchange Commission (SEC). The SEC is a government entity, created by law to protect investors and maintain the integrity of the securities market. The government thus has a large role in the operation of SEC. 11 of the Commissioners of the SEC are appointed by the President of Ghana. They may hold office for a maximum of 3 years and are eligible for reappointment. There are no specific criteria for being selected as a commissioner, though expertise or knowledge in the securities industry is often expected. Commissioners often are firmly connected to the government. The commission includes representatives from the Ministry of Finance and the Registrar General. According to Mr. Owoo, the Commissioners must have close contacts with the police, the media, Ministry of Finance, the Judiciary (Attorney General), and the Legislative branch in order to be successful. Lower level workers have contacts with businesses. Depending on the job within the SEC, networking capability may be a requirement. Foreign interaction at Mr. Owoo's level is high.

The final meeting of the day took place at the Venture Capital Trust Fund (VCTF), a government-established organization whose purpose is to fund domestic Small and Medium Enterprises (SMEs). The team met with Mr. Daniel Duku, the Fund's Chief Executive Officer and Mr. Anthony Siaw, an Investment Analyst.

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The VCTF is only 4 years old, and is funded almost exclusively by the government. The President appoints the board and the board elects the CEO of the firm. The members of the Board of Trustees (which includes Mr. Duku, the Chief Executive Officer) are appointed by the President of Ghana, but all other positions are chosen just as in the private sector: based on merit and experience. The VCTF also often sends its staff to foreign training programs, which enhances the overall human capital of the organization.

The firm works through fund managers and has a mandate to fund small and medium scale enterprises. The VCTF solely funds domestic businesses, in accordance with its government mandate to grow local businesses. Thus, the government has a large, strategic influence on the VCTF. From the conversation, it appears that, the majority of funding has been directed to already-established SME companies; little funding has been directed to “start-ups.”

Day 3: 14 July 2010

Dr. Riverson set up an interview with Dr. H.A. Obiri, the acting head of the Industrial Research Institute of the Council for Scientific and Industrial Research (CSIR). The Industrial Research Institute focuses on the development of small and medium-sized industries. It consists of four divisions: environmental management, energy technology, information management, and materials manufacture. The institute examines such concepts as renewable energy, oil and gas, and energy efficiency.

While few international businesses are involved with the CSIR, the organization highly values individuals who have foreign education and experience that they can bring into Ghana. Thus, networking with international sources is important to the advancement of their research.

Within CSIR, workers have the ability to organize and form unions to achieve their objectives. Unions exist at the national level and thus enable workers to advance their agendas. Political parties, just as in America, can be useful tools to garner support.

Finally the team met with Dr. A.W.Q. Barnor and Francis K. Nyoagbe of NTHC Limited (National Trust Holding Company). Dr. Barnor is the Managing Director of NTHC, which became the first investment and stock brokerage firm in Ghana when it was formed in 1976 by the government as a public, holding company that, additionally, had the task of establishing a stock exchange. The company is one of the original and largest in Ghana and is involved mostly in Initial Public Offerings, Asset Management and Investments. The largest investor in the firm is still the government, which holds a majority of its shares, but the company is technically a private company. The government no longer finances NTHC directly, but state companies do hold shares, which gives them, and thus, indirectly, the government, influence over the operations of NTHC. The government appoints the board members of state companies, and the state companies appoint the board members of NTHC. Thus, those with strong political connections have a significant advantage to receiving an appointment to higher positions within NTHC.

Dr. Barnor stated that the government is the engine of economic growth, which further ties NTHC to the government. So, foreign investors tend to be discouraged from investing in NTHC due to its slant towards the government. Dr. Barnor claimed that government connections from within NTHC are good for public relations, because investors recognize that NTHC conducts business legally. The team wonders if this was an attempt to protect himself and his company from anti-free-market criticism.

In the past, connections were important in the obtaining employment, but now qualifications are most important. For instance, when Dr. Barnor first entered the

company in 1996, there were only 3 college graduates. Now, everyone is expected to have a college degree in order to work at NTHC. The university from which individuals receive degrees, domestically or internationally, is irrelevant, but foreign applicants tend to have already received their Master's Degree (which are typically received out-of-country), and thus have a leg up in receiving employment and promotion.

Day 4: 15 July 2010

The team met again with Mr. Boahene, his supervisor, Mr. David Abbey, and several other employees of Fidelity Bank for an extended lunch meeting. When discussing both the challenges of growing small businesses in Ghana and, consequentially, the lack of SMEs involved in the Equity Market, we found that both were mainly due to cultural norms. Most small business owners are reluctant to become publicly-traded companies or add partners because of the fear that they will lose control of traditional family-based businesses. When working with the family, there is a level of trust that cannot be found elsewhere (this further exemplifies the importance of family ties in Ghana). Thus, culture is a deterrent to expansion of small business. Business owners also desire privacy. There is apparently a very strong resistance to disclosure and transparency. These two cultural limitations are a major obstacle to overcome in order to facilitate a transition from a Frontier to Emerging Capital Market.

The team then met with Mr. Emmanuel Tsigby who works for New World Renaissance-Ghana, a subsidiary of the Moscow-based Renaissance Group. His work includes stock trade execution and advice for both international and local clients. Due to the international nature of the company, NWR-G receives many foreign referrals. The most interesting line of discussion with Mr. Tsigby was the discussion about the University of Ghana. Graduates of the University of Ghana are in demand among Ghana's financial industry, which is due to its large student body as well as its standing as the best provider of business and finance students. Thus, it seems that success

within the financial sector of Ghana may depend on one's choice of college or university.

Day 5: 16 July 2010

The team met with Mr. Mayokun Ajibade, a Nigerian, who is Managing Director and Head of Global Markets for West Africa for Standard Chartered Bank. He indicated that Nigerian and Ghanaian markets are the most active in Africa, but they are still not active enough. Transportation, especially across borders, is a major obstacle to monetary union, due to infrastructure, congestion, and the difficult process of crossing the border.

His thoughts on the recruitment process were particularly interesting. According to Mr. Ajibade, hands-on experience and background are critical because they create workers who can adapt to change and operate in dynamic environments. This sometimes depends on one's childhood opportunities and upbringing. From his experience, those with American or foreign educations tend to be more well rounded than those raised and educated locally. Simply having been abroad "gets you in the door faster."

Dr. Riverson escorted the team back to one of the Institutes that are part of the CSIR, the Science and Technology Policy Research Institute (STEPRI). At the institute, the team met with the Director, Dr. George Essegbey and then spent a longer period of time with Dr. N. Obirih-Opareh, one of the Institute's Research Scientists. Much of our discussion was centered on MSMEs (Micro Small and Medium Enterprises), because we recognized that STEPRI executed a project in the last year that analyzed this important part of the Ghanaian economy. The purpose of their project was to promote growth of MSMEs by identifying and removing the obstacles that prevent the growth of MSMEs. It included both government and donor funding, and was ultimately backed by

the World Bank. (Note: Micro-enterprises include the street vendors that are so prevalent in Ghana.)

As a part of the larger social network within the Ghanaian economy, the team determined that the SMEs are fairly isolated. They usually purchase their goods from wholesalers from China and other foreign markets (the exact process and network that enables these transactions requires further research). However, at the lower levels, the networks are very tight among the sellers.

On one of the last nights in Ghana, the team went to dinner and a local bar/dance club, Rhapsody's, with David Abbey, the Asset Manager from Fidelity Bank with whom we had lunch two days prior. A friend of his, Jophiel Nyemitei, a Managing Director of African Legacy Finance Limited, joined us. Rhapsody's may have been the most interesting venue in Ghana that we witnessed. It was a very new and posh establishment that catered to middle and upper middle class people, mainly locals. It seemed that David and his friend, who came to dinner with us, knew all the locals in the bar. Everyone recognized everyone, and everyone could engage in conversations with everyone. While the Ghanaian people are hospitable and friendly in general, the patrons knew each other on a more personal level. Most of them had all attended the same secondary schools and, often, the same universities. The older private mission schools are more prestigious and of better quality education than public schools. These schools seem to be where the social networks of upwardly mobile Ghanaians are created. Additionally, the majority of individuals we met at the bar worked in some way or another in business or finance. Rhapsody's was a place of social gathering for many people in this network, which would indicate strong social capital exists and is created at venues like this.